

Annual Report of Chief Engineer  
State Highway Department  
1929

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Dover, Delaware  
December 31, 1929

To the Chairman  
And Members of the  
State Highway Department  
Dover, Delaware  
Sirs:-

Pursuant to the law, I herein submit a report of the work accomplished by the State Highway Department during the year 1929, with a list of roads for which petitions have been presented, asking for their construction as State Highways, and with certain recommendations for the year 1930.

**SURVEYS** Before the final location of a road can **AND PLANS** be intelligently decided upon, preliminary surveys must be made to secure information on which to make the final decision. Relative costs, distances, service to the traveling public, and safety are some of the factors to be considered. When the final locations have been determined, the final surveys are made and plans prepared for advertising.

During the year 1929, two survey parties have been in the field and have completed surveys as follows:

Base Line .....	77.3	Miles
Topography . . . . .	55.3	Miles
Cross Sections, Preliminary and final .....	153.96	Miles
Contracts staked out for construction .....	61.08	Miles
Borrow Pits Cross Sectioned .....	78	

In addition, numerous surveys have been required for rights of way and other purposes.

The drafting department has had an exceptionally busy season. Additional work has been required owing to the construction of several low cost road projects. Such a program makes more demands on the drafting department because of the fact that more miles can be built with the same expenditures. In spite of the additional work, no increase in the force has been made.

The Highway Department owns and operates its own blueprinting plant where all plans are prepared and furnished to contractors bidding on work, to the engineers in charge of work in the field, and for filing with the Federal Bureau of Public Roads.

A summary of the work of the drafting department follows:

Line Plotted .....	81.08	Miles
Cross Sections plotted, original and final.....	151.99	Miles
Cross Sections Planimetered, original & final.....	155.98	Miles
Profile and Grade laid .....	65.25	Miles
Index Map plotted and traced .....	62.7	Miles
Plan and profile traced .....	65.25	Miles
Plotting, planimentering and computing .....	78	Borrow Pits

**RIGHT OF WAY** During the year from December 1, 1928 to December 1, 1929, the right of way department has had one of its busiest years. This was caused, principally, by the construction of the dual highway from State Road to St. Georges. This contract required the acquiring of an additional right of way 70 feet in width.

On new roads, exclusive of the State Road-St. Georges contract, the right of way department has secured the right of way on 16 contracts, having a mileage of 53.65 miles, and 297 properties. Of these properties, 286 were acquired by option, and 11 have been condemned. Title has already been obtained on 224 of these properties. In addition, the department has acquired title to 151 properties on old contracts, 121 by deed and 30 by condemnation, on 5 of which an appeal was taken.

On the State Road-St. Georges Contract, 7.66 miles in length, right of way has been obtained on the twenty-five properties, twenty by deed and five by condemnation.

The work on the Philadelphia Pike consisted of acquiring title to 17 properties, 6 by deed and 11 by condemnation.

A summary of the year's work is as follows: Descriptions written 344; options obtained 329; deeds executed 371; releases from mortgages and judgments executed 215; condemnation commissions 45; condemnation juries 5; houses moved 24; barns and garages moved 12.

The following is an itemized account of the monies expended to obtain this right of way:

Salaries and Expenses .....	\$ 4,101.75
Legal .....	8,733.09
Right of Way .....	16,754.92
Fencing .....	16,016.12
Moving Buildings .....	25,668.32
Condemnation Costs and Awards .....	14,866.64
Crops and Trees .....	1,381.90
Miscellaneous .....	642.43
	<hr/>
	\$88,165.17

The costs as given include all expenses made necessary by the re-alignment and widening of State highways, including salaries, title searches, preparing and recording deeds and releases, condemnation costs and awards, house moving and alterations, fencing, and crop and property damages.

**TESTING**           The Testing Laboratory has been **LABORATORY** conducted, during 1929, in much the same manner as in previous years and at practically the same unit cost. Increased attention was paid, however, to the supervision of the quality of what might be termed less important materials—materials of which relatively small quantities were used, such as Terra Cotta Pipe, Corrugated Metal Pipe, Hydrated Lime, and Calcium Chloride.

Since Delaware has had a continuous road building program for the last eleven years, the question of materials



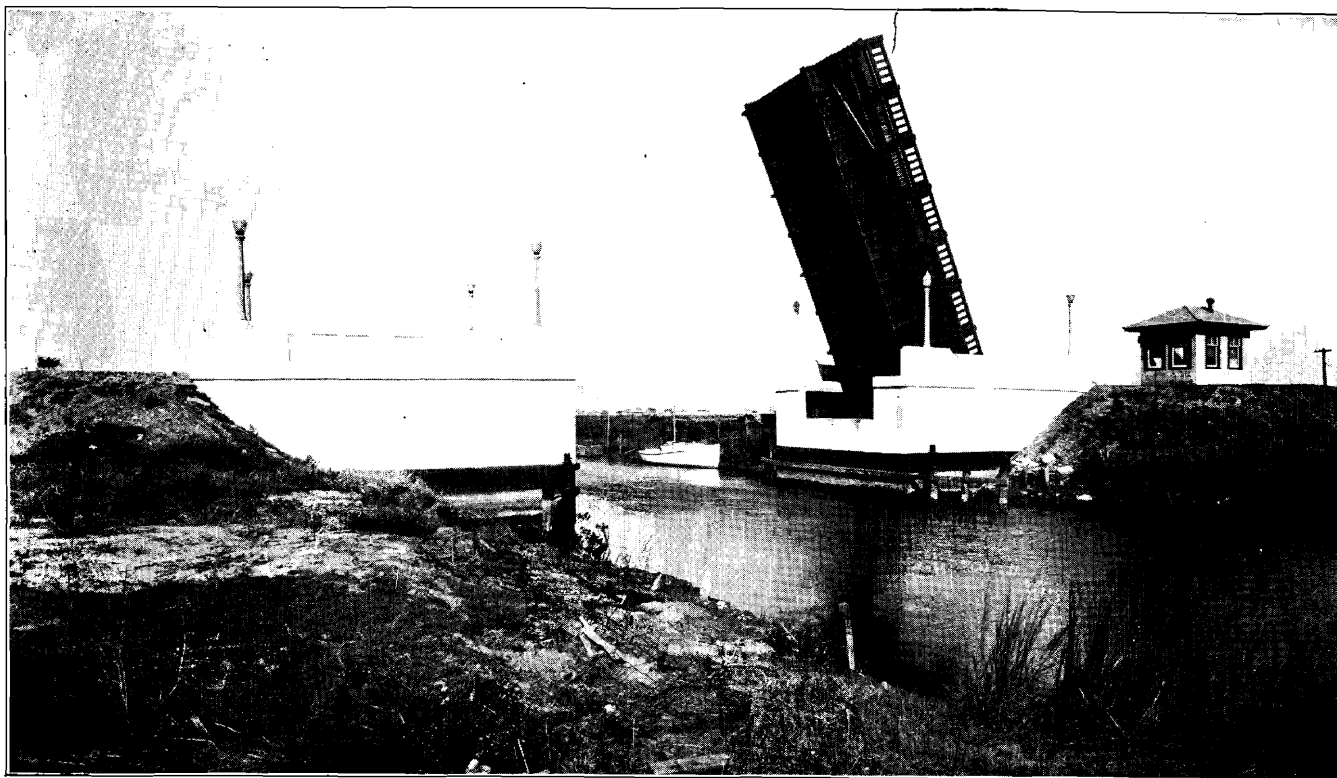
Bridge Over Christiana River at Newport, New Castle County

has become almost a standardized one. The extent and quality of available materials has been determined as closely as it is possible to do so. These materials are not uniformly acceptable, however, and constant routine tests are necessary so that no objectionable or doubtful material may be allowed for use. Most of the materials used are, of necessity, shipped into the State from outside sources; for example, Portland Cement, Crushed Stone, Hydrated Lime, Calcium Chloride, Terra Cotta Pipe, Reinforced Concrete Pipe, Corrugated Metal Pipe, Reinforcing Steel, and Asphalt.

Wherever possible the policy of the Laboratory, of having materials inspected and accepted or rejected at their source, was followed. While in some cases this entailed a somewhat greater cost, it is thought that this was justified in that rejections after arrival on the job, with the consequent delays, were avoided.

The previous policy of having all cement tested by a Commercial Laboratory at the respective cement mills, has been followed this year. This Commercial Laboratory operates under the supervision of the Testing Department and is subject to constant check tests by our Laboratory at Dover. Cement, at time of manufacture, is stored in sealed bins, and all tests are completed before shipments are started from any bin. All cars are sealed when loaded, and, in this manner, it is assured that only pre-tested and accepted cement is used. The cost of this service is the largest single item in the total cost of the Testing Department, but is much less than it would be if all these tests were made at the Dover Laboratory. In this event, it would be necessary to maintain an employee at nearly all of the cement mills to forward samples and to supervise the storage of the cement from the time of its manufacture until it is shipped. When handled by a commercial laboratory, this cost is less than two cents per barrel of cement used.

During 1929, the Testing Department revised the general specifications for all classes of work. Since the last specifications had been issued, a number of developments and refinements, in methods of construction, as well as a



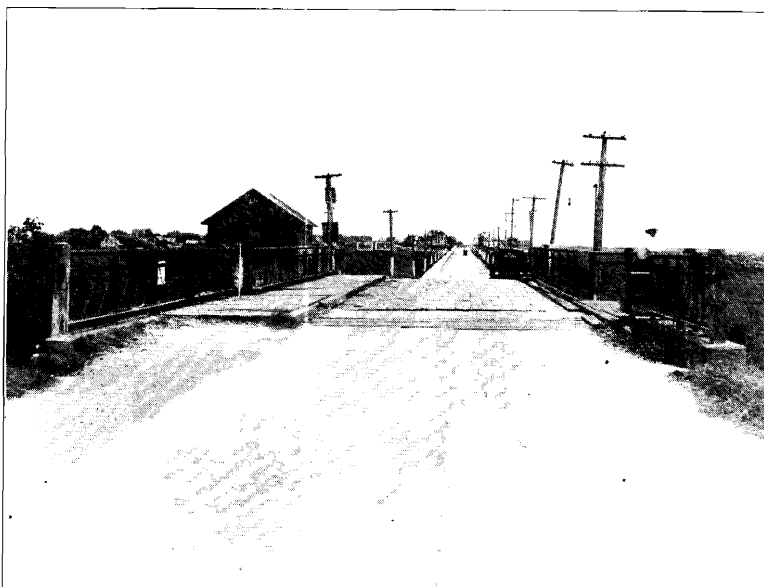
Bridge Over Lewes and Rehoboth Canal, Lewes, Sussex County

general increase in the quality of Portland Cement, had been made. The new specifications were written with these in mind, as well as certain changes in methods of construction required by the U. S. Bureau of Public Roads on Federal Aid contracts.

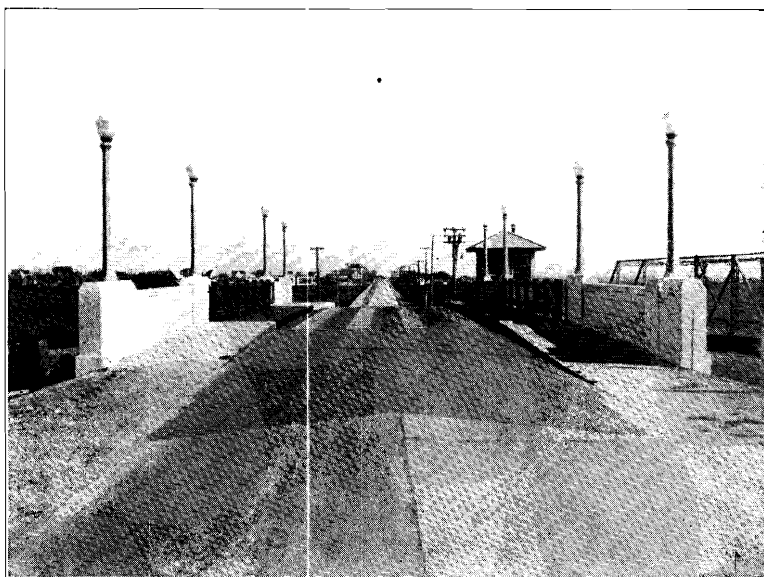
In joining the new concrete highway from State Road to St. Georges with the present roadway at the Canal Bridge at St. Georges, it was necessary to use a type of cement which would allow the new concrete to be opened to traffic a short time after it was poured. Otherwise a long detour would have been necessary. Accordingly, a brand of high early strength cement, designed for this purpose, was used. This particular brand of cement had been under investigation in our Laboratory for the preceding year and had been found satisfactory for the purpose intended. At the time this intersection was constructed, the Laboratory made specimens on the job as the concrete was being poured. These specimens were brought to Dover and tested at stated intervals. When these specimens indicated sufficient strength had been reached in the slab, it was opened to traffic. By this method, one-way traffic was continuously maintained, and the new construction was opened to traffic two days after it was laid.

**BRIDGES** In addition to the more or less routine  
**AND** work of making drainage surveys and pre-  
**CULVERTS** paring plans for 22 small bridges and 191  
culverts, costing some \$85,000.00, the Bridge Department  
has had under construction several important structures.

The re-construction of the Lewes Bridge has been completed at a cost of \$54,875.00. This was a rolling bascule bridge erected in 1914 by the Levy Court of Sussex County and operated by hand. The foundation had become undermined, necessitating the entire removal and replacement. The old structural steel was used, a sidewalk added, electric motors installed for its operation, new abutments sunk below any future possible dredging depths, and new approaches completed, making an attractive and modern structure.



**Bridge Over Lewes and Rehoboth Canal at Lewes, Sussex County,  
Before Being Rebuilt**



**Bridge Over Lewes and Rehoboth Canal at Lewes, Sussex County,  
After Being Rebuilt**



In cooperation with the Pennsylvania Railroad, the over-head bridge at Farnhurst has been re-built and widened to accommodate four lanes of vehicular traffic; and, in addition, two sidewalks were provided. This removes the only obstruction to the free flow of traffic between Wilmington and the Canal.

Another important bridge completed during the year was the rolling lift bascule structure over the Christiana at Newport. Construction was begun early in the year, and the completed bridge opened for traffic on December 1.

This bridge was designed with a 30-foot clear roadway with 5-foot sidewalks on either side and a total length of 276 feet. The movable span is 55 feet in length, being 50 feet clear between fenders, and is operated by two 10 HP electric motors, either of which will operate the bridge satisfactorily under normal conditions.

The approaches are attractively lighted, and the most modern safety warning devices have been installed. The total cost of the completed structure was \$149,035.00.

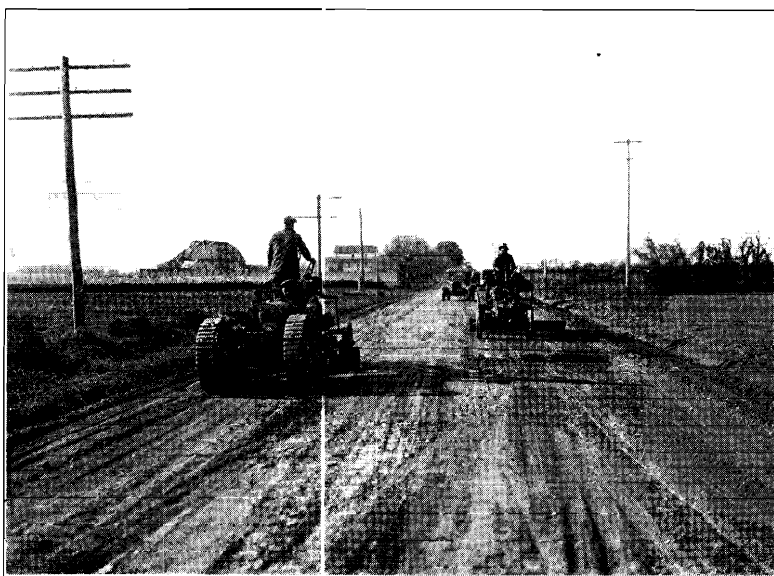
The Department, during the year, has entered into an agreement with the Pennsylvania Railroad for the elimination of the grade crossing on the Maryland Division immediately north of the Newport Bridge. Contracts have been let by the Railroad Company and the work is now in progress. The completion of these two projects will be of great importance, not only to the town of Newport, but will supply an important and safer link in the highway system between western Pennsylvania and the New Castle Ferries.

After considerable delays, owing to unexpected and difficult foundation conditions, the Garrison Mill Bridge was completed and opened to traffic in November. It is a reinforced concrete slab and girder bridge of three 16-foot spans with a 32-foot clear roadway. Its final cost was \$18,270.06.

There is under construction, and will be completed early in 1930, an over-head counterweight, rolling leaf bascule bridge over the Mispillion River near Milford. This will be



**Dover-Hazlettville State Highway, Kent County, Traffic Bound Slag**



**Dover-Hazlettville State Highway, Kent County, Traffic Bound Slag**

a part of the Milford Cutoff, which will be put under construction early in the year. This bridge will have a clear span of 45 feet with two approach spans of 22 feet each, a waterway of 24 feet, and a single 5-foot sidewalk. The total length will be 140 feet, 6 inches. The steel is now being erected. The total contract price is \$56,581.00.

**CONSTRUCTION** During the year, 10 lettings were held, bids were received and contracts awarded for 21 road contracts, 3 bridge contracts, and 3 building contracts. The total of these contracts amounted to \$1,351,731.38, of which \$1,197,100.00 was for the construction of highways. A total of 142 bids was received, or an average of about 5 per contract.

All bids received were checked, tabulated, and mimeographed, and copies distributed to contractors and other interested parties.

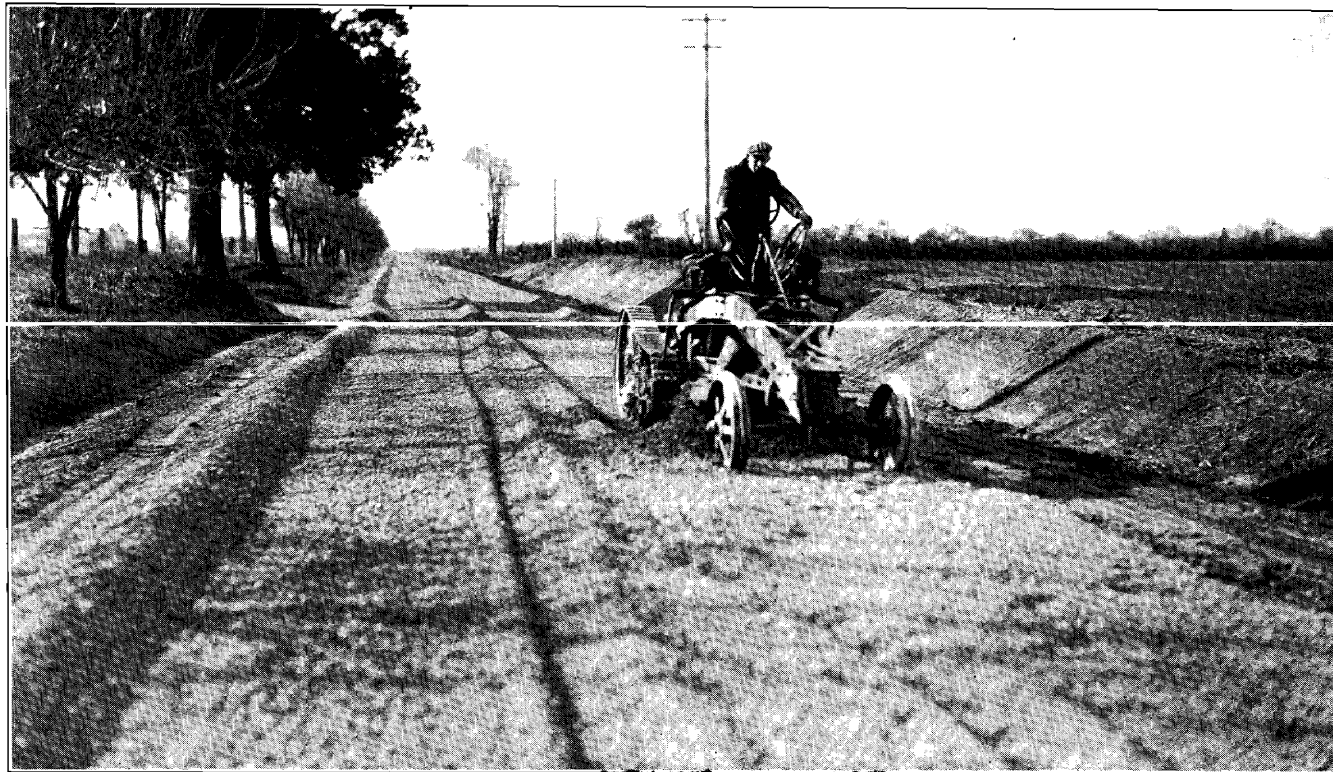
Road contracts were entered into totaling 63.28 miles. Of this total, 43.8 miles were of concrete, 14.67 miles of traffic bound slag, and 4.81 miles of gravel. Brought forward, also, into this year's construction, were 3 miles of hard surface highway of the 1928 program.

Unusually favorable weather conditions have enabled the completing of all paving projects, with the exception of 1.8 miles on the Levels Road near Middletown.

The addition this season of the 61.48 miles constructed, to the previous State System, totals 753 miles, or approximately 20% of the entire road mileage of the State.

The work this year has marked something of a departure from the work of previous years. In following out the policy of the Department, of providing highways to serve the traffic needs of all its people, it has become necessary to change somewhat the types of construction as previously designed.

All of the more important roads having been paved, there remained two urgent problems to be met. The supplying of satisfactory all year types on the less important



**Dover-Hazletville State Highway, Kent County, Traffic Bound Slag**

roads and the widening of existing routes where traffic has outgrown present widths and capacities.

The farm roads, now unimproved, are of little importance to the general public, but are of greatest importance to those residing on or owning properties along them, and to improve them within a reasonable length of time will require cheaper types of construction than those which have been standard in Delaware since 1918.

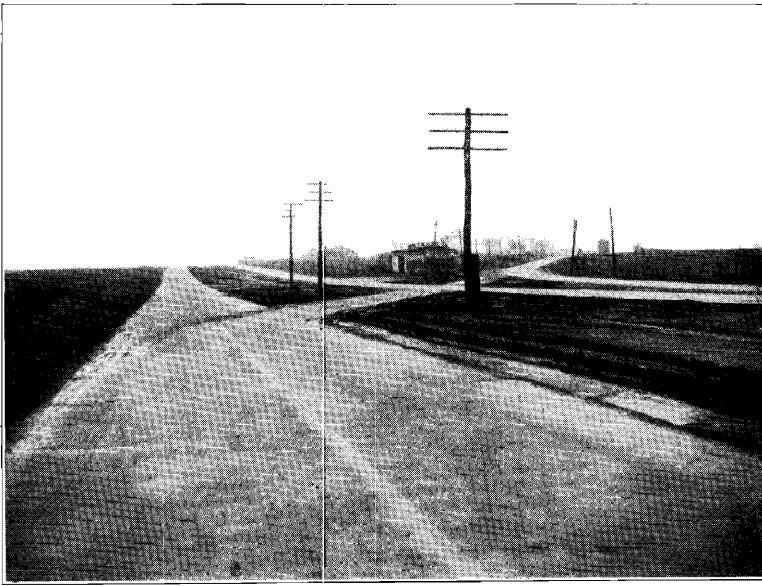
To meet this demand, the Department, during the year, has awarded several contracts for lower type roads, some of which are frankly experimental, but, which, if they prove satisfactory, will enable a much larger mileage to be constructed than would otherwise be possible, and so bring appreciably nearer the day when every farm has an improved road.

About 15 miles of traffic bound slag road have been constructed during the year. This type has been used very successfully in some parts of the middle west on roads carrying a traffic of not over 500 vehicles per day.

The road is first brought to proper grade, and crushed stone or slag, not exceeding one inch in size, is spread at a rate of approximately 1000 tons per mile. The greater part is then bladed in windrows on either side, and a thin layer of loose stone is maintained on the surface. As fast as this layer is worked into the subgrade, additional stone is brought in until a firm surface is secured. Repeated dragging and blading results in a remarkably smooth riding surface.

The cost has averaged \$6,700.00 per mile, including grading, drainage, structures, and the surfacing described. It will require a full cycle of seasons before drawing definite conclusions as to its value for use in Delaware.

Early in the year, the Department purchased a gravel pit east of Georgetown, and one contract was entered into, of 4.9 miles, using this material for surfacing. This will undoubtedly furnish a suitable surfacing on roads of light traffic within the economic limits of haul.



**St. Georges to State Road State Highway, U. S. Route 13, New Castle County, Dual Highway With Crossover at Intersection**



**St. Georges-State Road State Highway, New Castle County  
Dual Highway**

Going to the other extreme, there has been constructed, during the year, a dual highway between State Road and St. Georges, 7.67 miles in length, which will greatly speed up traffic between these points, and, it is believed, also lessen the number of accidents.

A 20-foot concrete pavement was built parallel to and 50 feet east of the original duPont Highway. One way traffic will be maintained on these two roadways. This highway is in the final stage of completion and now open for traffic its entire length. Preparations are being made to plant the center strip, and plans for this purpose are being prepared by the State Forester. The opinion of the motoring public as to this type of design will be received with interest.

Before continuing this construction further, it is the plan to get a comparison of the relative merits of this type of construction and the four lane type that extends from State Road to Wilmington.

The completion, during the year, of the Milford-Greenwood and the Milton-Ellendale roads in Sussex County, the Frederica-Harrington Road in Kent County, and the Gap Road in New Castle County, has made important connections to the main highways. Important feeders completed are the Laurel-Independence School Road in Sussex County, the Woodland Beach Road in Kent County, and the Dexters Corner-Delaney Road in New Castle County.

Attached are tables showing the contracts awarded during the year, their contract price, location and type.

# **TABULATION OF CONTRACTS AWARDED IN 1929**

Contract No.	Location	Cost Total	Contractor	Length (Miles)	Type of Roadway
114	St. Georges-State Road .....	\$ 359,854.50	Old Line Const. Co., Chestertown, Md.....	7.66	Dual Rd. 20' Con.
103A	Newport Bridge Superstruc- ture .....	74,420.00	Al S. Fox, Dayton, Ohio.....		
104A	Milford Bridge Substructure .....	25,985.00	George Shockley, Rehoboth, Del.....		
87A	Leipsic-Cowgills Cor. Bridge Rep. ....	1,835.00	Gooden & Clark, Dover, Del.....		
115	Milford toward Cedar Neck.....	33,199.50	W. W. Truitt, Lincoln City, Del.....	1.22	14' Concrete
116	Newport Gap Road .....	68,180.00	D. E. O'Connell & Sons, Ridley Park, Pa.....	2.00	9' Concrete
117	Milton-Ellendale .....	136,798.50	Hwy. Engr. & Const. Co., Selbyville, Del.....	6.01	15' Concrete
2D	Garrison Mill Bridge .....	19,440.00	George & Lynch, Dover, Del.....		
104B	Milford Bridge Superstructure .....	32,957.50	George & Lynch, Dover, Del.....		
113	Laws School-Harrington .....	71,809.50	George & Lynch, Dover, Del.....	4.77	
120	Laurel-Independence School.....	61,099.80	Walter Roach, Georgetown, Del.....	3.73	15' & 9' Concrete
118	Dexters Cor.-Delaney .....	61,017.80	Knox-Mariani Co., Ardmore, Pa.....	4.30	9' Concrete
121	Wendall's Cor.-Woodland Beach .....	73,419.00	D. E. O'Connell & Sons, Ridley Park, Pa.....	3.96	9' Concrete
CS60	Bacon toward Smith Mill .....	59,626.50	Hwy. Engr. & Const. Co., Selbyville, Del.....	3.00	9' Concrete
122	Gravel Hill-Zoar Camp .....	20,651.50	Field, Barker & Underwood, Philadelphia, Pa.....	4.81	20' Gravel
123	Farnhurst Bridge Approaches .....	23,083.00	D. E. O'Connell & Sons, Ridley Park, Pa.....	0.43	40' Concrete
124	Roxana-Millville Road to Bayard .....	11,076.50	Field, Barker & Underwood, Philadelphia, Pa.....	1.60	14' Slag Traf. Bd.
125	Hazlettville-Dover .....	43,822.00	George & Lynch, Dover, Del.....	6.90	16' Slag Traf. Bd.
127	Surface Treatment .....	12,362.20	Good Roads Co., Philadelphia, Pa.....	26.00	
126	Flowers Station to Md. Line.....	26,499.50	Field, Barker & Underwood, Philadelphia, Pa.....	3.97	16' Slag Traf. Bd.
131	East State St., Delmar .....	12,517.00	Hwy. Engr. & Const. Co., Selbyville, Del.....	0.51	16' Concrete
132	Bethany Beach Camp Road.....	4,380.00	Walter Roach, Georgetown, Del.....	0.21	5' Conc. Wdg.
103B	Newport Bridge Approaches.....	11,380.00	D. E. O'Connell & Sons, Ridley Park, Pa.....	0.15	20' Concrete
135	Farmington-Andrewsville .....	16,609.58	Field, Barker & Underwood, Philadelphia, Pa.....	2.20	16' Slag Traf. Bd.
119	Levels Road .....	59,071.50	Knox-Mariani Co., Ardmore, Pa.....	3.96	9' Concrete
137	Noxontown Road .....	27,354.00	Knox-Mariani Co., Ardmore, Pa.....	0.95	16' Concrete
		\$1,336,376.18		62.34*	

\* This total does not include Contract 127, Surface Treatment.



**BUILDINGS** In September, contracts were entered into for the remodeling and enlarging of the Department offices at Georgetown. In carrying out necessary repairs, it was considered advisable to add another story and provide offices for the Motor Vehicle Department and other State Departments if required.

This work has been completed at a total cost of \$6,737.88, and a building suitable for its intended purposes and in harmony and keeping with its surroundings has been secured.

The increasing amount of maintenance and snow removal equipment has made necessary larger storage space at State Road, and contracts have been awarded for the construction of a concrete block building 100 feet by 34 feet, which will be completed early in January and will provide ample storage space for some time to come. The contract price for this building is \$5,072.00.

There has also been constructed, during 1929, a brick police station house at Station No. 1, Penny Hill, at a cost of \$6,175.00.

**ESTIMATES** During the year, 124 estimates, totaling \$2,075,431.64, on 53 different contracts, have passed the office for payment, including 31 final estimates and all Federal Aid Vouchers. All items upon the above contracts were computed and checked. Before the 1930 construction season starts, all final estimates will be paid with the exception of two.

**MAINTENANCE** No road is permanent, except as it is permanently maintained. Working on this principle, the Department has kept 22 maintenance crews at work throughout the year, repairing damaged portions of the roadway; filling cracks, ruts and eroded portions of the shoulders; clearing culverts and ditches; cutting woods and grass growing on the right of way; collecting rubbish and refuse scattered by careless tourists; repairing and placing route markers and safety signs; repairing and repainting guard fence; painting traffic lines; repairing, clearing and



Newport-Gap State Highway, New Castle County

painting bridges; planting and trimming trees upon the right of way; removing snow; and performing many other duties incident to the proper maintenance of the 688 miles in the State System.

The total cost of this work for the 12 months ending November 30, including the cost of equipment purchased during the year, has been \$242,613.83, or an average of \$352.64 per mile. Of this amount \$64.53 per mile was for the purchase of trucks and new equipment.

Owing to the prolonged period of drought during the middle and late summer, earth shoulders were unusually difficult to maintain in good condition and required constant attention. The same cause was instrumental in destroying considerable numbers of the shade trees planted along the highways. 2207 Oriental Planes, 3180 American Elms and 150 Weeping Willows were planted during the season. These trees were exceptionally good for the most part, but the long continued dry weather prevented any considerable growth or development.

The roads as a whole, however, have been maintained according to our usual high standards. It was necessary to surface treat 26 miles of the bituminous types. This was done by contract at a cost of approximately \$500.00 per mile. It is hoped that, with the surface secured by this latest treatment, further treatments will not be necessary oftener than every second or third year.

**HIGHWAY MARKERS** The American Association of State Highway Officials, in cooperation with the U. S. Bureau of Public Roads, have designed a system of signs for uniformly marking the highways of the United States. These have been approved by the Department; and, as rapidly as the former markers require replacement, the new U. S. Standard signs are being erected. Those already erected have been favorably commented upon. The more important markers are of the latest reflecting button type and are a decided improvement over the old types. Since the erection of the new signs, it has been observed that there

has been a decidedly more general observance of them, especially those requiring the boulevard stop.

These signs have been officially adopted by practically all the states, and motorists will now be able to travel throughout the country without the annoyance of learning a new sign code in every state.

**STATE**           The activity and general usefulness of the  
**HIGHWAY** State Highway Police increases from year to  
**POLICE** year. This force, first organized with one officer in 1919, has been gradually increased from year to year until in June 1929 it was increased to a body of 50 uniformed men.

The original uniform of the Police was hardly distinguishable from that of a host of chauffeurs, garage attendants and others. Accordingly a uniform, consisting of navy blue cap and coat, with olive drab trousers, was adopted during the year and is now the official uniform.

The duties of this force, as defined in Volume 34, Chapter 34, of the laws of Delaware, are "primarily to compel the enforcement of all laws relating to the weight, speed, and operation of vehicles on the public highways of this State \* \* \* \* and are hereby authorized, empowered and directed to suppress all acts of violence and to enforce all laws relating to the safety of persons and property."

In carrying out their duties as required by the Statute, the Force, during the 12 months ending December 31, 1929, patrolled 664,241 miles of highways, made 5347 arrests for 108 different causes, ranging from murder to vagrancy, issued 24,199 reprimands, weighed 25,164 trucks, inspected 10,104 cars for lights and brakes, and secured convictions resulting in fines collected totaling \$79,300.50 for the period.

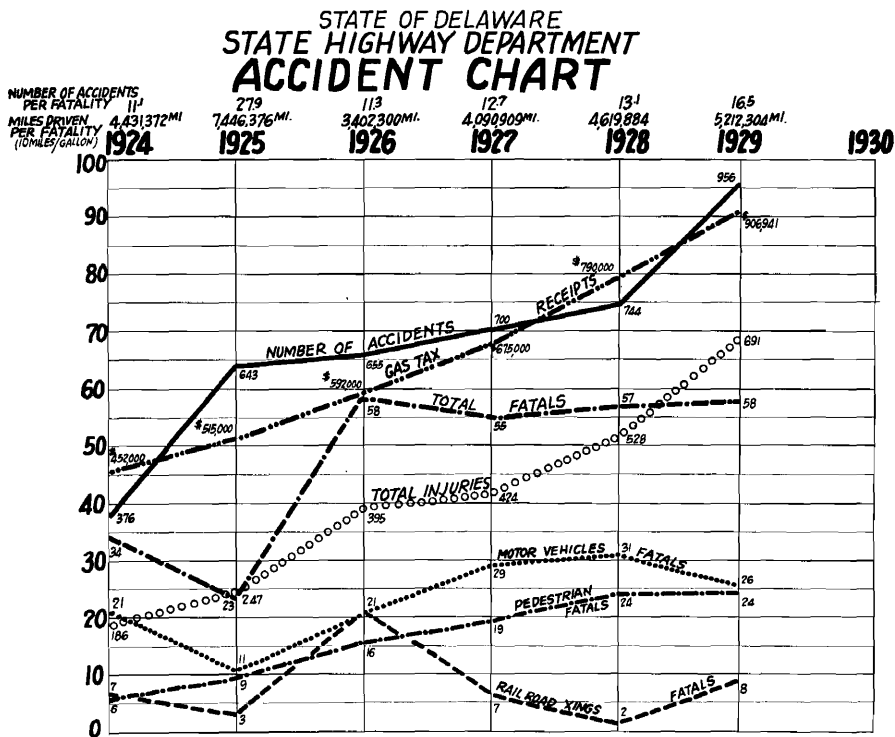
This shows an increase of 62% in the number of arrests and 48% in the total of reprimands over the previous year. Eighty-seven stolen cars were recovered. It may be interesting to note that the force has been credited with making the first arrest on record "for operating an airplane while under the influence of intoxicating liquor."

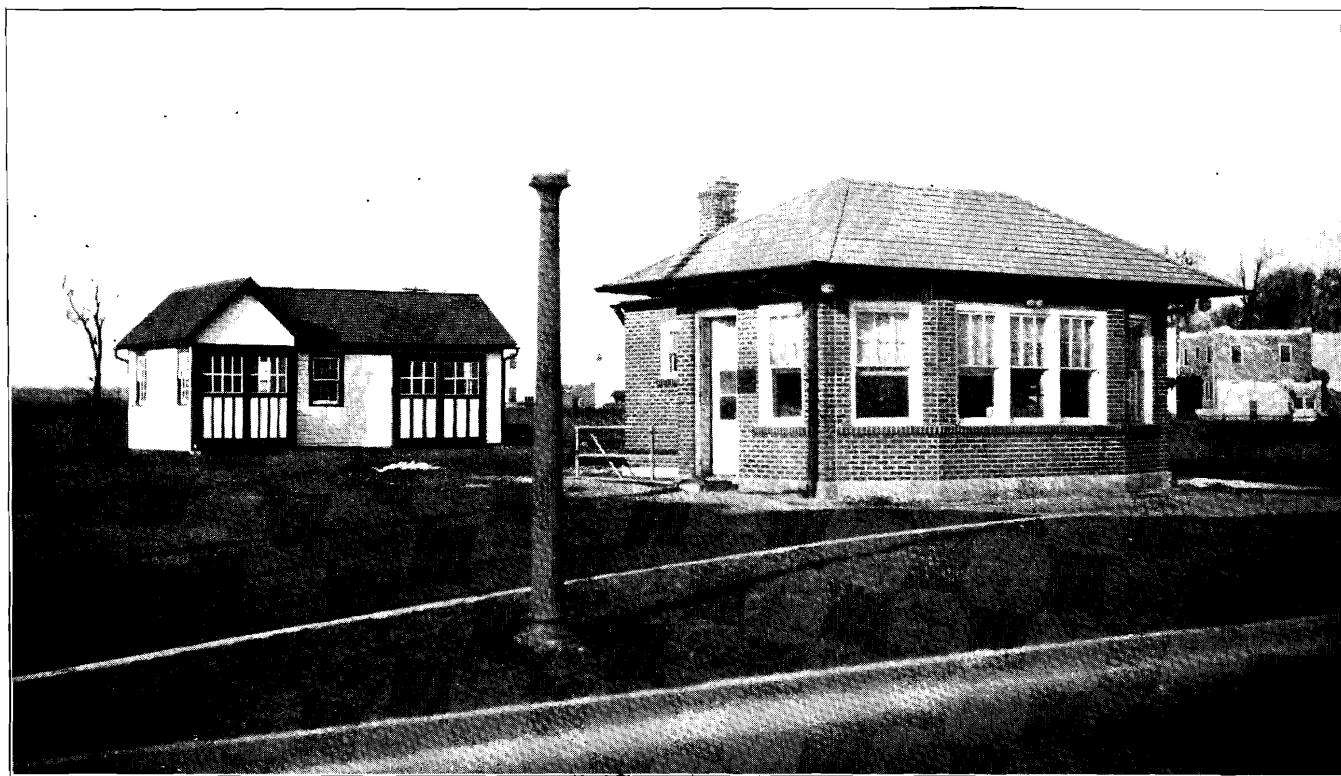
Of the 5347 arrests, 4622 were for violations of the motor vehicle laws, the largest number for any one cause being 2189 for reckless driving.

A complete tabulation of arrests and of accidents and their causes is appended.

In addition to the routine work as shown, officers of the force have given 75 safety talks at schools, in an effort to educate the school children along the lines of safety especially as relating to pedestrians.

I am attaching a chart showing the gasoline consumption in the State during the years 1924 to 1929 together with the total number of accidents, total fatalities, and the number of fatalities from the various causes.





State Highway Police Station No. 1, U. S. Route 13, New Castle County

This graph shows that with an increase of gasoline consumption of 53% since 1926 and a corresponding increase of traffic, there has been no similar increase in fatalities which, if there had been, the same increase would have totalled 90 for the present year instead of 58, as shown.

This is a favorable showing and should offer encouragement to the Department, the Safety Council, and the motorists and citizens of the State who have cooperated in making this result possible and should stimulate to increased effort for the protection of human life upon the highways of the State.

Figuring gasoline consumption at 10 miles per gallon, 3,402,300 miles were traveled in 1926 for each fatality while for the year 1927, 1928 and 1929, the miles traveled were 4,090,090, 4,619,880, and 5,206,890 miles respectively.

This indicates that travel on our highways has been growing safer during the past four years instead of more dangerous, which is, I believe, contrary to the general opinion.

The station building at Station No. 1, Penny Hill, had become inadequate and out of keeping with its immediate surroundings. A new and attractive brick building has been constructed during the year to replace it and is a valuable addition to the properties of the Department. It includes a standard steel cell for holding dangerous or violent prisoners.

Station No. 3, at Dover, is also too small for the work required, and I would recommend that it be replaced by a new and permanent building during the year.

I wish to express at this time my appreciation of the loyalty and faithful service rendered by the officers and men of the State Highway Police during the past year and to affirm my confidence in their worth and effectiveness.



**Greenwood-Milford State Highway, Sussex County, 15-foot Concrete Roadway**



**WIDENING HIGHWAYS** It has been the policy of the Department to widen highways as soon as the needs of traffic demonstrate its necessity. This policy should be continued.

The duPont Boulevard from Milford to Selbyville is paved but 14 feet in width. This is the only through highway in the State which is now less than 16 feet in width. At certain seasons of the year, this road carries a very heavy truck traffic; and, at such times, other motorists are subjected to considerable inconvenience and danger especially at night.

This road, some of which was constructed in 1912, is of a lighter section than is now standard. While as yet there is no evidence of failure, which is striking evidence of the quality of the original construction, it is certain that it is stressed nearly to its limit with the constantly increasing loads to which it is subjected. I would, therefore, recommend that this road be widened its entire length as soon as possible. Traffic counts taken this year indicate about 50% more traffic on the Georgetown-Selbyville Road than on the Georgetown-Milford Section, and I would recommend that work be begun in 1930 on the widening below Georgetown.

**SIDEWALKS** In his report for the year 1927, Governor, then Chief Engineer, Buck recommended the construction of sidewalks along certain highways of the State. Following his recommendation, sidewalks were constructed by the Department at certain locations along the Philadelphia Pike and along the duPont Boulevard near Farnhurst. I believe this policy should be continued and sidewalks constructed at such locations as are known to be hazardous. The Department should not, however, in my opinion, assume the responsibility of such work where it is the obligation of a municipality or an individual. A map, showing the location of pedestrian fatalities, totalling 83, from the year 1924 to date, has been prepared. This shows that the pedestrian fatalities, which comprise 36% of all the motor vehicle fatalities of the State outside the city of Wilmington, are grouped



Andrewsville-Farmington State Highway, Kent County, Traffic Bound Slag Road

almost entirely in the suburban regions around Wilmington and in the outskirts of the towns of the State. Study shows that 45% of the deaths occurred on highways within 6 miles of the city of Wilmington.

At a comparatively small cost, sidewalks could be constructed in the most heavily traveled sections, and I would, therefore, recommend the immediate building of sidewalks at the following locations:

City Line to Farnhurst  
Eden Park to Rose Hill School  
New Castle to Buttonwoods  
Thru the town of Marshallton

**FEDERAL AID** Since 1921, Federal Aid for highways has been allotted to the States to the amount of \$75,000,000.00 annually, of which Delaware's share has been \$365,625.00; a bill is now before Congress authorizing the increase of the appropriation to \$125,000,000.00. Should this become the law, as now seems probable, Delaware would receive an annual increase of \$243,000.00.

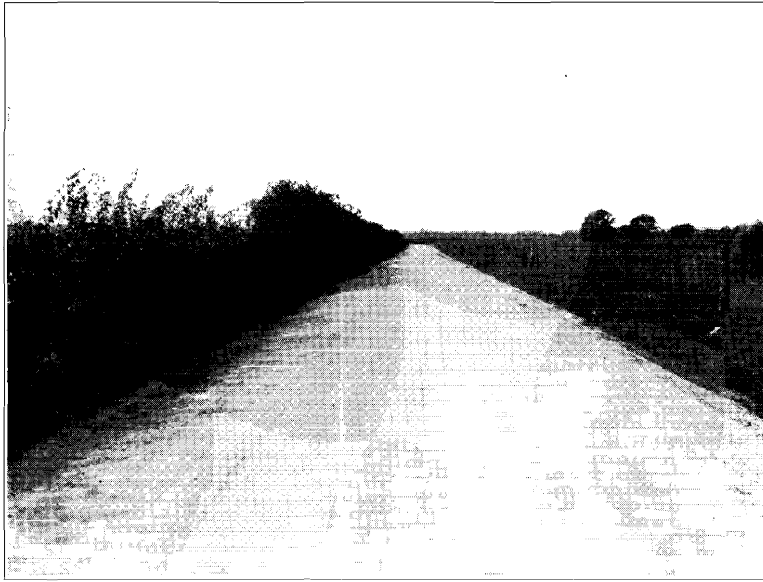
This will be an important addition to the resources of the Department on the adoption of "the pay-as-you-go" policy during the year 1930 as now planned.

**PUBLIC LANDS** The General Assembly of 1929 passed legislation abolishing the Public Lands Commission and placing its duties upon the State Highway Department. The transfer was made on June 1, 1929.

The Department is completing the surveys of the State Lands, and during the coming winter will establish permanent markers and erect suitable signs indicating ownership by the State.

A road to the Atlantic Ocean, on the north side of the Public Park, north of the town of Rehoboth, will be constructed early in the year.

There was a balance of \$5,392.39 in the Public Lands Fund on November 30, 1929. A statement of this account will be a part of the Secretary's report for the year.



**Dirt Road East of Denny's Corner, Near Dover, Kent County, Scraped and Reshaped With Road Machines—Light Surfacing of Local Gravel**



**Hazlettville-Maryland Line Highway, Kent County, Dirt Road Scraped and Reshaped With Road Machines**

**DIRT**            During the summer, the Department took **ROADS** over for maintenance and experiment two roads in Kent County and one in Sussex, totaling 15.2 miles.

The Denny's Corner Road, in Kent County, connects the duPont Boulevard with the Little Creek-Leipsic Road near Leipsic, and is 4 miles in length. This road was graded and ditched with a machine grader and crowned with an automatic crowner. A layer of local sand and gravel was then added after which the road has been dragged with the crowner at weekly intervals. The result has been most satisfactory, and during the fall and early winter this road has been in excellent condition.

The total cost of this work was approximately \$600.00 per mile. While the effect of repeated freezing and thawing on this road will probably be destructive, and the entire winter and spring will be required to complete the test, enough has been seen already to show that great improvement in many of our dirt roads could be obtained at a moderate cost.

From Hazletville west to Coopers Corner, 4.2 miles, similar work was done but no good local material was found to apply as a surface. Accordingly, sections have been surfaced with various materials, viz: stone screenings, slag, slag screenings, and local sand; other sections have received no surfacing whatever. This road had been neglected for a long period, and extensive grubbing, clearing and ditching was necessary.

In Sussex County, the road from Five Points to Fairmount has been similarly maintained. One section of this road near Five Points has received a surfacing of stone screenings. In general, on this road, sand has been placed upon the clay sections and clay upon the sandy sections. An average of \$375.00 per mile has been expended on this road.

It would be unwise to draw any general conclusions as to the value of this work until a full year's experience is available. It may be confidently asserted, however, that the



**Cedar Neck-Milford State Highway, Sussex County**



**East State Street, Delmar, Dividing Sussex County, Delaware and  
Wicomico County, Maryland**

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maintenance in 1930 will be but a small part of the cost for 1929. These roads are being kept under close observation, and valuable information is certain to be secured as to the possibilities of the improvement of earth roads carrying light traffic. The location of these test roads was selected partly on account of local conditions and partly for accessibility of observation.

**HIGHWAY BEAUTIFICATION** As reported under maintenance, there have been planted, during the year, over 5,000 trees along the highways. This work, which has been carried on from year to year, has covered practically all the main highways where such planting is practicable.

Plans are being prepared by the State Forester for the improvement of the strip between the dual road from State Road to St. Georges, and part of it, at least, is expected to be planted during the spring of 1930.

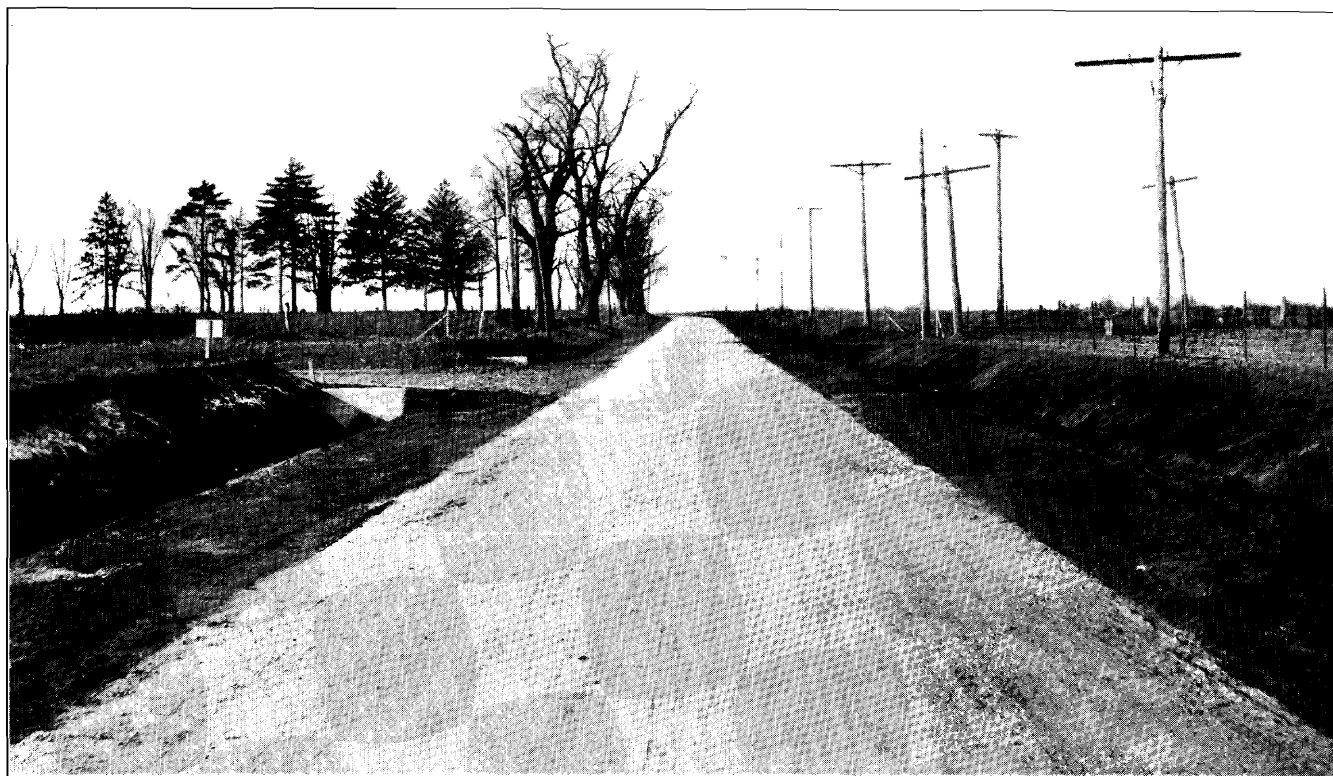
The frequent mowing of rights of way is a part of the general policy of making the highways attractive, and is an important feature of Delaware's Highway beautification.

**PUBLIC UTILITIES** The modern highway is not only an artery for travel by automobile, but is used to carry telephone and telegraph messages, electricity for lighting and power, and gas for light and heating.

During the year the Department has had an unprecedented number of applications for such franchises and has continued its policy of granting franchises for a limited term of years under certain restrictions in all cases where public necessity and convenience demanded.

Particular attention has been given to restricting trimming of trees within the right of way. The total number of franchises granted has been thirty-six.

The most important undertakings carried on during the year have been the installation of under-ground telephone conduits between Wilmington and Dover along the duPont Boulevard and from State Road to the Maryland Line along



**Noxontown State Highway, Near Middletown, New Castle County, 16-foot Concrete Road**



the State Road-Elkton Highway. The construction of gas lines between New Castle and Newport, between Basin Corner and Farnhurst, and between Dover, Cheswold, Smyrna and Clayton, as well as numerous electric lines, all assist in bringing advancement and modern improvements and convenience to those living on the farms and the rural communities.

**PLANT AND EQUIPMENT** The maintenance of highways by modern and efficient methods requires the use of a large amount of mechanical equipment. Foremost in importance are trucks, which are used for patrolling, hauling mowers, tar kettles, drags, graders, material to surface shoulders, and for snow removal.

The present practice in Delaware gives each maintenance crew 2 trucks, one of 1 to 1½-ton capacity for light work, and the other for heavy hauling, pulling graders, and for snow removal work. The light trucks are all of modern design; but, with the exception of 3 modern trucks purchased this year, the remainder are Government surplus equipment allotted by the War Department following the War and are 11 to 12 years old. This equipment has rendered very valuable service to the State, but the repeated re-conditioning of these trucks is expensive and unsatisfactory, and it is believed it is economically unwise to continue this practice any longer. I would, therefore, recommend the retirement of the older equipment from service whenever its condition becomes such as to require extensive repairs.

**SNOW REMOVAL** The blocking of the highways by snow, for any considerable period, causes a serious upset in the business and social life of the State. In order to insure the prompt clearing of the 753 miles of the State Highway System, I would recommend the purchase, in 1930, of 5 new, high speed, heavy duty trucks of the 4 wheel drive type, similar to those purchased this year.

The snowfall during 1929 was very light, but past experience shows that a snowfall of sufficient amount to seriously affect traffic may be expected every 2 to 4 years.

**FORTY-THIRD STREET BY-PASS** In his report for the year 1927, Governor, then Chief Engineer Buck recommended the construction of a by-pass connecting the Philadelphia Pike via 43rd Street to Miller Road to relieve the congestion of traffic on North Market Street. Rights of Way were not available at that time, nor were the plans of the city for the future development of this area then completed. The rights of way can now be secured, and I would, therefore, recommend that this project be authorized for construction during 1930.

**RECOMMENDED ROADS** I recommend that the roads chosen for improvement during the coming year be selected from the following list, petitions for the construction of nearly all of which have been received by the Department.

#### **NEW CASTLE COUNTY**

Relocation Lincoln Highway through Marshallton  $\frac{1}{4}$  Mile.  
Old Baltimore Pike (Cooch's Bridge-Maryland Line).  
New London-Newark.  
Delaware City-Port Penn.  
Walker's School-David's Corner.  
Adam's Dam-Thompson's Bridge.  
Industrial Highway (Wilmington).  
Clayton-Delaney.  
Clark's Corner-duPont Road.  
Clayton-Green Spring.  
Walker School-Taylor's Bridge.  
Centerville-Perry's Tavern.  
Brandywine Sanitarium-Lincoln Highway.  
Newark-Md. Line (Conowingo Road).  
Porter Station-Cooch's Bridge.  
Middletown-Mt. Pleasant.  
Porter Station-Red Lion.

#### **KENT COUNTY**

Hazlettsville-Md. Line. Also continuing "Y" from Hazlettsville to Bethesda Church via Pratt's School.  
Blackiston's-Millington.  
Kenton-Blackiston's.  
Brenford-Seven Hickories.  
Thompsonville-South Bowers.  
Woodside-Willow Grove Petersburg Road.  
Barker's Landing-Magnolia.  
Houston-Staytonville.  
Viola-Petersburg.  
Moore's Corner (Cheswold-Kenton Road) Dover-Pearson Road.  
Todd's Church-Prospect Church (Harrington).  
King's Highway, Dover.

Andrewsville-Greenwood.  
 Andrewsville-Vernon.  
 Masten's Corner-Felton Hollandsville Highway.  
 Hartly-Md. Line (Sudlersville).  
 Hartly-Cedar Corner.  
 Staytonville-Farmington.  
 Wendall's Corner-Bayview School.  
 Owens Station-Staytonville.  
 Prettyman's Corner-Williamsville.  
 Vernon-Brownsville.  
 White Hall Neck Road.  
 Mott's Corner-Leipsic Road.  
 Barker's Landing-Little Creek.  
 Hollandsville-Md. Line via Edwardsville.  
 Harrington-Whitelysburg.

## SUSSEX COUNTY

Delmar-Ward's School.  
 Bethel to Laurel-Sharptown Road.  
 Bowden Garage-Green's Mill.  
 Sunnyside School-Bridgeville.  
 Delmar-Columbia.  
 Seaford-Atlanta.  
 Hardscrabble-Millsboro.  
 Vine's Creek-Y. W. C. A. Camp-Sandy Landing.  
 Dagsboro-Millsboro-Laurel Road near Mission.  
 Millsboro-Sandy Forks to Concord Road where it intersects  
   Laurel-Georgetown Road.  
 Frankford-Shaftox.  
 Double Bridges-Robbins.  
 du Pont Boulevard-Milford-Selbyville (Widen).  
 Lowes Cross Road thru Gumboro to Selbyville.  
 Smith Mill-Elliott's School.  
 Owens-Ellendale.  
 Lincoln City-Milford-Rehoboth Road.  
 Marshy Hope Road-State Highway, North of Greenwood.  
 Lone Gum-Seaford-Bridgeville State Highway via Old Furnace.  
   Mill and Middleford.  
 McCallister Corner-Atlanta.  
 Williamsville-Bayview-Fenwick Island.  
 Roxana-Sound Church Road.  
 Concord-Laurel Georgetown Road via Spicer's Mill.  
 du Pont Boulevard to Shortly.  
 Collins' Mill-Middleford.  
 Frankford-Roxana.  
 du Pont Road (Widening Georgetown-Selbyville).  
 Zoar Church-Millsboro.  
 Springfield Cross Roads-Georgetown.  
 Stockley to Angola via Zoar Church and Hollyville.  
 Five Points-Fairmount.  
 Lowe's Corner towards Gumboro.  
 Greenwood towards Scott's Store.  
 Bryan's Store-Sandy Forks.  
 Lincoln City-Clendaniel's Mill.  
 Laurel-Millsboro via Bryan's Store.  
 Hardscrabble-Bryan's Store.

The Department has been fortunate in having the knowledge and experience of His Excellency, Governor Buck, available since he took up his duties as Governor last January. His advice and counsel have been invaluable and have been freely sought and as freely given. I wish also to acknowledge the support and counsel I have received from each member of the Department and the loyalty, willingness and faithfulness which all those, associated with the Department, have shown during the year just closed.

Respectfully submitted,

W. W. MACK  
Chief Engineer

## STATE HIGHWAY POLICE

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### ARRESTS MADE DURING THE YEAR 1929

Abduction . . . . .	1
Abortion . . . . .	1
Accessory . . . . .	3
Aiding and Abetting . . . . .	2
Aiding prisoner to escape . . . . .	2
Allowing minor to operate a motor vehicle . . . . .	13
Allowing unlicensed person to operate . . . . .	102
Allowing an unregistered car to be operated . . . . .	2
Assault . . . . .	5
Assault and Battery . . . . .	91
Assault felonious . . . . .	5
Assault to murder . . . . .	8
Assault to ravish . . . . .	2
Bastardy . . . . .	1
Breach of peace . . . . .	1
Breaking and entering . . . . .	25
Breaking jail . . . . .	1
Burglary . . . . .	1
Carrying concealed a deadly weapon . . . . .	16
Defacing and destroying property . . . . .	1
Defective brakes . . . . .	56
Desertion (wife) . . . . .	1
Discharging firearms near highway . . . . .	1
Disorderly conduct . . . . .	62
Drunk and disorderly . . . . .	175
Failing to render aid to the injured . . . . .	2
Failing to report accident . . . . .	1
Failing to signal . . . . .	4
Failing to stop before entering main highway . . . . .	115
Following fire engine too close . . . . .	4
Forgery . . . . .	3
Fugitive from justice . . . . .	7
Gambling . . . . .	7

Giving wrong name in applying for license .....	1
Having for hire a car that is uninsured .....	35
Held for investigation .....	4
Highway robbery .....	3
Horse drawn vehicle no light .....	20
Illegally entering United States .....	1
Impersonating an officer .....	1
Improper lights .....	77
Improper tags .....	107
Insane .....	4
Interfering with an officer .....	6
Interfering with operator .....	12
Larceny .....	113
Leaving accident .....	28
Livestock running at large .....	1
Loaning license plates .....	8
Loaning operator's license .....	15
Making false affidavit .....	1
Making threats .....	11
Malicious mischief .....	1
Manslaughter .....	29
Murder .....	6
No clearing lights .....	52
No horn .....	9
No learner's permit .....	3
No mirror .....	106
No muffler .....	19
No operator's license .....	742
No photo on paid driver's license .....	7
No public service permit .....	2
No title for car .....	5
No weight on side of truck .....	2
No windshield wiper .....	3
Non-support .....	11
Obtaining money under false pretenses .....	4
Operating aeroplane intoxicated .....	1
Operating after revocation .....	16
Operating while intoxicated .....	303

Overloaded trucks .....	80
Parking no light .....	8
Parking on highway .....	17
Passing on right .....	11
Passing traffic light (red) .....	27
Passing worthless check .....	24
Playing crap .....	4
Pointing a firearm .....	3
Possession of drugs .....	4
Possession of hypodermic needle .....	1
Possession of stolen car .....	5
Possession of stolen goods .....	2
Possession of whiskey .....	9
Receiving stolen goods .....	1
Reckless driving .....	2,189
Refusing to stop upon request of officer .....	4
Runaway from Ferris Industrial School .....	1
Runaway from home .....	7
Running over fire hose .....	1
Selling car without title .....	3
Selling liquor .....	2
Sodomy .....	1
Taking car without the owner's consent .....	16
Threatening to kill .....	3
Throwing glass on highway .....	4
Trailer too long .....	1
Transporting liquor .....	11
Transporting unmarked apples .....	4
Trespassing .....	10
Unregistered car .....	385
Using female child for immoral purpose .....	2
Using cut-out .....	2
Vagrancy .....	1
Violating age of consent law .....	2
Violating Compulsory school law .....	1
Violating learner's permit .....	9
Wife beating .....	2

Total number arrests .....	5,347
Total number reprimands .....	24,199
Total number trucks weighed .....	25,164
Total number miles patrolled .....	664,241
Total number cars inspected for lights and brakes..	10,104
Total number hours spent on investigation.....	742
Total number hours spent on Special Duty .....	11,900
Total number hours spent on duty .....	130,867
Total number stolen cars recovered .....	87
Total number school busses inspected .....	96
Number of schools visited .....	75
Number of pupils addressed .....	9,200

## STATE HIGHWAY POLICE

### REPORT OF ACCIDENTS

For The Year 1929

Total number accidents .....	956	
Total number killed .....	58	
Total number injured .....	691	
Estimated Property Damage .....	\$166,761.00	
<b>Fatalities</b>	{	
	Motor Vehicles .....	26
	Pedestrians .....	24
	Railroad Crossings .....	8
	Streetcar Crossings .....	0
<b>Injured</b>	{	
	Slight .....	559
	Serious .....	38
	Slight .....	79
	Pedestrians	
	Serious .....	15
<b>Condition of Highway</b>	{	
	Dry .....	709
	Wet .....	247
<b>Location</b>	{	
	Straight Road .....	588
	Intersection .....	257
	Railroad Crossing .....	24
	Streetcar Crossing ....	11
	Curve .....	78



## CAUSES

Recklessness . . . . .	219
Inattention . . . . .	145
Jay Walking . . . . .	75
Skidding . . . . .	67
Operating while intoxicated . . . . .	57
Loss of Control . . . . .	44
Failing to stop upon entering main highway . . . . .	39
Driving on wrong side of road . . . . .	32
Ran off roadway . . . . .	30
Failing to signal . . . . .	30
Cutting In . . . . .	29
Driving too close . . . . .	24
Driving while asleep . . . . .	18
Passing without proper clearance . . . . .	15
Obstructed view . . . . .	14
Glaring headlights . . . . .	14
Inexperienced operator . . . . .	13
Bad brakes . . . . .	12
No lights (auto) . . . . .	11
Tire (blow out) . . . . .	9
Animal on highway . . . . .	9
Pedestrian (intoxicated) . . . . .	8
Breaking of steering gear . . . . .	7
No tail light (auto) . . . . .	6
Parking no lights . . . . .	6
Wagon no lights . . . . .	5
Operator confused . . . . .	4
Breaking of radius rod . . . . .	3
Passenger grabbed steering wheel . . . . .	2
Parking on concrete . . . . .	2
Obstruction on road . . . . .	1
Passing on right . . . . .	1
Bad eyesight . . . . .	1
Axle breaking . . . . .	1
Not stated . . . . .	3

TYPE OF VEHICLE INVOLVED IN ACCIDENT	<i>Number of Accidents</i>		
	<i>Total</i>	<i>Fatal</i>	<i>Non-Fatal</i>
Passenger cars . . . . .	1298	50	1248
Commercial cars . . . . .	233	3	230
Omnibus . . . . .	24	1	23
Motorcycle . . . . .	23	2	21
Wagons . . . . .	21	0	21
Bicycles . . . . .	6	0	6
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Totals . . . . .	1605	56	1549

#### HIGHWAYS

State . . . . .	720	40	680
County . . . . .	111	5	106
Towns . . . . .	90	4	86
Railroad Crossing . . . . .	24	7	17
Streetcar Crossing . . . . .	11	0	11
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Totals . . . . .	956	56	900

#### LIGHT CONDITIONS

Daylight . . . . .	535	28	507
Darkness . . . . .	421	28	393
	<hr/>	<hr/>	<hr/>
Totals . . . . .	956	56	900

#### DAY OF OCCURENCE

Sunday . . . . .	230	9	221
Monday . . . . .	114	8	106
Tuesday . . . . .	112	5	107
Wednesday . . . . .	102	7	95
Thursday . . . . .	118	8	110
Friday . . . . .	103	6	97
Saturday . . . . .	177	13	164
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Totals . . . . .	956	56	900

*Number of Accidents*  
*Total      Fatal   Non-Fatal*

WEATHER CONDITIONS

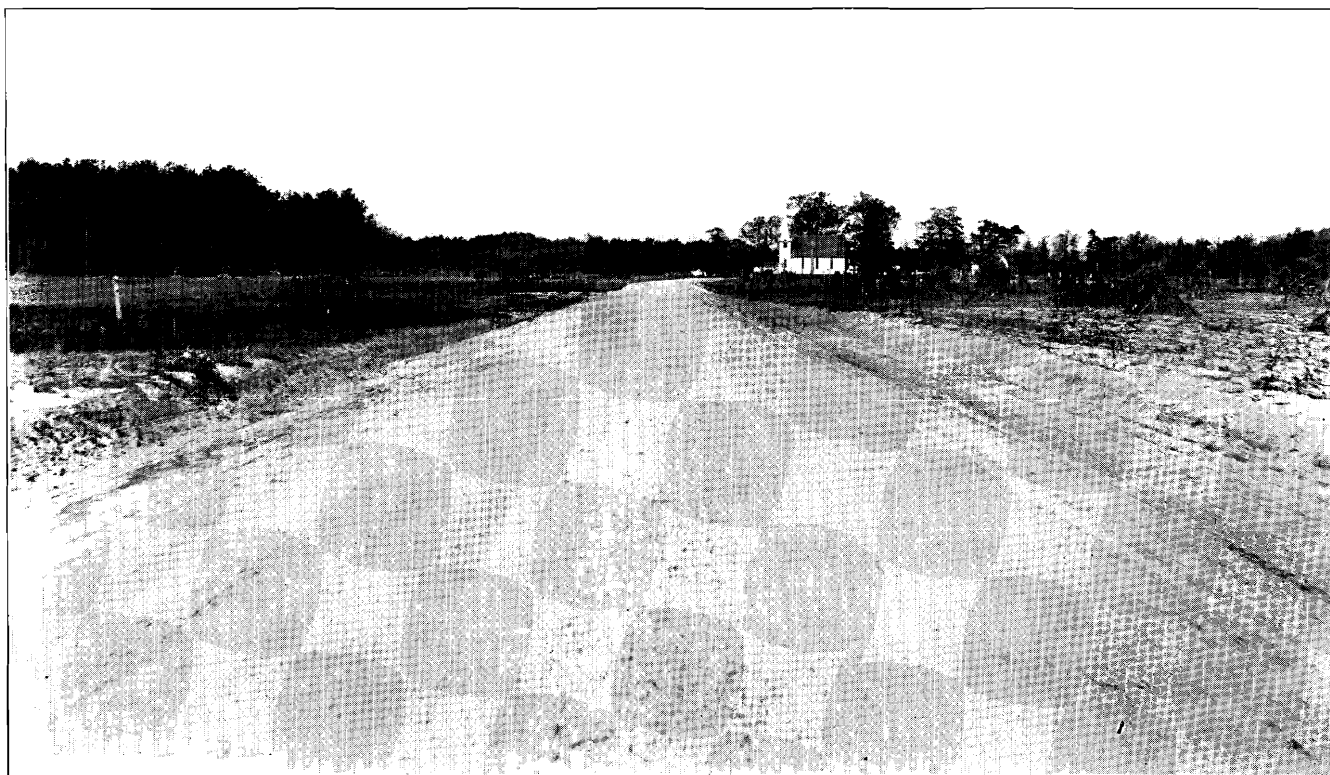
Rain . . . . .	155	5	150
Fog . . . . .	47	1	46
Clear . . . . .	656	43	613
Snow . . . . .	15	1	14
Cloudy . . . . .	83	6	77
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Totals . . . . .	956	56	900

TYPE OF ACCIDENT

Collision with auto . . . . .	569	10	559
Non-collision accident . . . . .	102	7	95
Collision with fixed object . . . . .	85	6	79
Collision with pedestrian . . . . .	111	24	87
Collision with horse drawn Veh. . . . .	21	0	21
Collision with train . . . . .	22	7	15
Collision with streetcar . . . . .	12	0	12
Collision with bicycle . . . . .	6	0	6
Collision with motorcycle . . . . .	19	2	17
Collision with animal . . . . .	9	0	9
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Totals . . . . .	956	56	900

HOOR OF OCCURENCE

12 to 1 A. M. . . . .	38	4	34
1 to 6 A. M. . . . .	80	4	76
6 to 7 A. M. . . . .	25	3	22
7 to 8 A. M. . . . .	31	0	31
8 to 9 A. M. . . . .	35	0	35
9 to 10 A. M. . . . .	37	2	35
10 to 11 A. M. . . . .	29	0	29
11 to 12 A. M. . . . .	41	2	39
12 to 1 P. M. . . . .	39	4	35
1 to 2 P. M. . . . .	38	2	36
2 to 3 P. M. . . . .	42	0	42
3 to 4 P. M. . . . .	57	5	52



**Gravel Hill to Zoar Camp Road, Sussex County, Gravel Road**

<i>Number of Accidents</i>			
	<i>Total</i>	<i>Fatal</i>	<i>Non-Fatal</i>
4 to 5 P. M. ....	68	1	67
5 to 6 P. M. ....	72	4	68
6 to 7 P. M. ....	83	5	78
7 to 8 P. M. ....	54	5	49
8 to 9 P. M. ....	51	5	46
9 to 10 P. M. ....	51	1	50
10 to 11 P. M. ....	55	6	49
11 to 12 P. M. ....	30	3	27

Totals.....	956	56	900
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#### DRIVER'S SEX

Female . . . . .	120	5	115
Male . . . . .	1352	51	1301

Totals.....	1472	56	1416
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#### DRIVER'S AGE

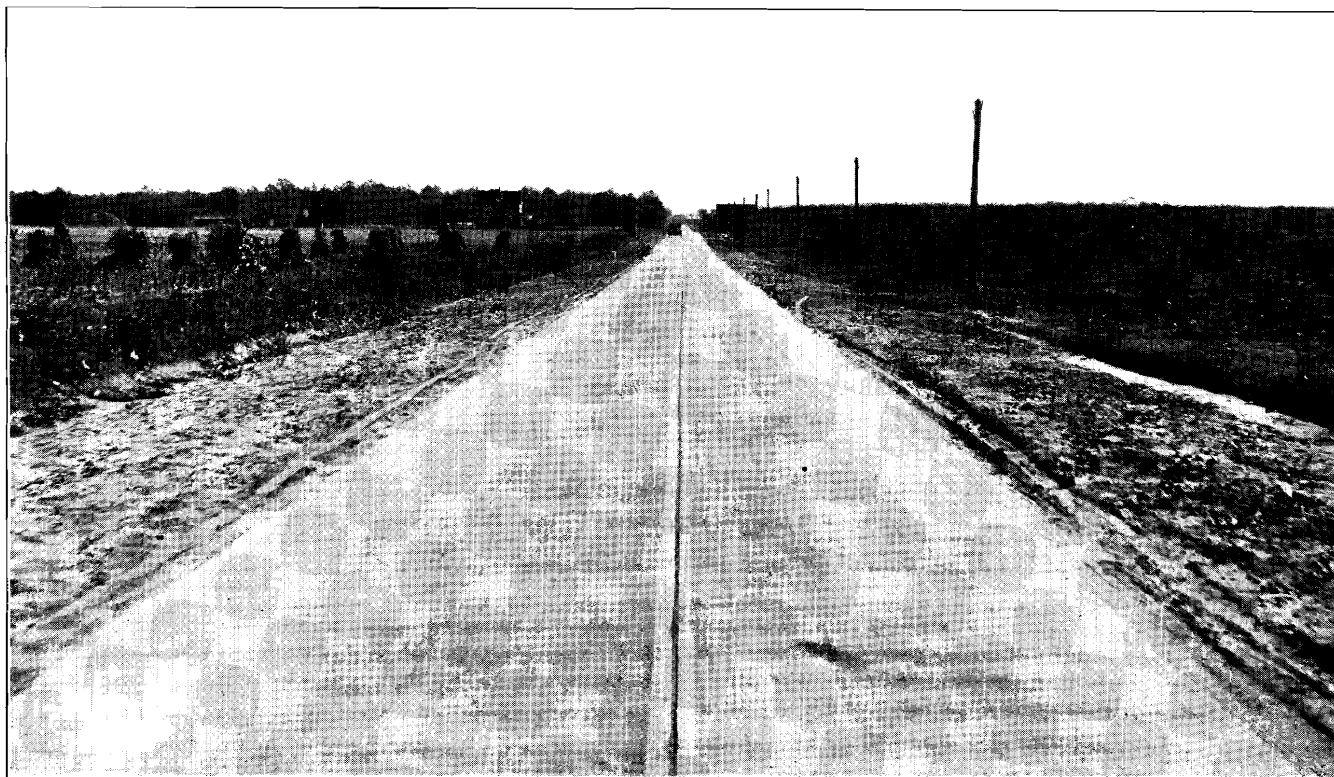
Under 18 years . . . . .	45	2	43
18 to 24 years . . . . .	375	12	363
25 to 54 years . . . . .	959	33	926
55 and over . . . . .	117	6	111
Not stated . . . . .	66	3	63

Totals.....	1562	56	1506
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#### DRIVER'S EXPERIENCE

Less than 3 months . . . . .	36	1	35
6 to 12 months . . . . .	35	0	35
12 months to 2 years . . . . .	118	6	112
2 years or more . . . . .	1280	35	1245
Not stated . . . . .	93	14	79

Totals.....	1562	56	1506
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**Ellendale-Milton State Highway, Sussex County**